

CLAIMS

1. A process for reducing the levels of undesirable impurities in a mesotrione sample, said process comprising the steps of:
  - 5 (i) forming a mesotrione enolate solution in an aqueous solvent,
  - (ii) carrying out one or more purification processes, and
  - (iii) crystallising the purified mesotrione out of solution.
2. A process according to claim 1, wherein the process further comprises a distillation  
10 step.
3. A process according to claim 1 or 2, wherein the one or more purification processes are selected from the group consisting of filtration, adsorption treatment, extraction with an organic solvent, and decantation.  
15
4. A process for reducing the levels of undesirable impurities in a mesotrione sample, said process comprising: a distillation step, formation of a mesotrione enolate solution; one or more purification steps; and crystallisation of mesotrione.
- 20 5. A process for reducing the levels of undesirable impurities in a mesotrione sample, said process comprising: formation of a mesotrione enolate solution; decantation, filtration and adsorption treatment carried out in any order; and crystallisation of mesotrione.
- 25 6. An integrated manufacturing/purification process for mesotrione, said process comprising the steps of:
  - (i) reacting cyclohexanedione with 2-nitro-4-methylsulphonyl benzoyl chloride (NMSBC) to form an enol ester followed by a rearrangement process to give mesotrione;
  - 30 (ii) formation of mesotrione enolate in aqueous solution;

- (iii) carrying out one or more purification processes, and
- (iv) crystallising the purified mesotrione out of solution.

- 5 7. A process according to claim 6, wherein said process further comprises a distillation step.
8. A process according to claim 6 or 7, wherein the NMSBC is first subjected to a carbon purification treatment.
- 10 9. An integrated manufacturing/purification process for mesotrione, said process comprising: reacting cyclohexanedione with 2-nitro-4-methylsulphonyl benzoyl chloride (NMSBC) to form an enol ester followed by a rearrangement process to give mesotrione; a distillation step; formation of a mesotrione enolate solution; one or more purification steps; and crystallisation of mesotrione.
- 15 10. An integrated manufacturing/purification process for mesotrione, said process comprising reacting cyclohexanedione with 2-nitro-4-methylsulphonyl benzoyl chloride (NMSBC) to form an enol ester followed by a rearrangement process to give mesotrione; formation of a mesotrione enolate solution; decantation, filtration and
- 20 adsorption treatment, carried out in any order; and crystallisation of mesotrione.
11. A process for preparing mesotrione, said method comprising:
- (i) Oxidation of NMST to give crude NMSBA;
  - (ii) conversion of NMSBA to NMSBC;

25 (iii) reacting cyclohexanedione with 2-nitro-4-methylsulphonyl benzoyl chloride (NMSBC) to form an enol ester followed by a rearrangement process to give mesotrione;

  - (iv) formation of mesotrione enolate in aqueous solution;
  - (v) carrying out one or more purification processes, and

30 (vi) crystallising the purified mesotrione out of solution.

12. The method of claim 11, wherein the process further comprises partial purification of the crude NMSBA.
- 5 13. The method of claim 11 or 12, wherein the process further comprises a distillation step.
- 10 14. A process for preparing mesotrione, said process comprising: oxidation of NMST to give crude NMSBA; optional partial purification of crude NMSBA; conversion of NMSBA to NMSBC; reacting cyclohexanedione with 2-nitro-4-methylsulphonyl benzoyl chloride (NMSBC) to form an enol ester followed by a rearrangement process to give mesotrione; a distillation step; formation of potassium enolate mesotrione solution; one or more purification steps; and crystallisation of mesotrione.
- 15 15. A process for preparing mesotrione, said process comprising: oxidation of NMST to give crude NMSBA; optional partial purification of crude NMSBA; conversion of NMSBA to NMSBC; reacting cyclohexanedione with 2-nitro-4-methylsulphonyl benzoyl chloride (NMSBC) to form an enol ester followed by a rearrangement process to give mesotrione; formation of a mesotrione enolate solution; decantation, filtration and adsorption treatment carried out in any order; and crystallisation of mesotrione.
- 20